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supporting engagement, co-design and adaptation

An introduction to systems thinking and systemic design – concepts and tools

- it's a way of collaboratively talking about and designing real-world solutions

Will Allen & Margaret Kilvington

Content guide

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01 Introduction
Why decision-makers are moving towards a systems thinking approach to better deal with complex situations in health, environment, education, etc.

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linking systems thinking and design

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Introduction to range of tools/methods that support systems thinking and systemic design in practice

05 Nurturing
Nurturing & supporting systems thinking in your practice

01

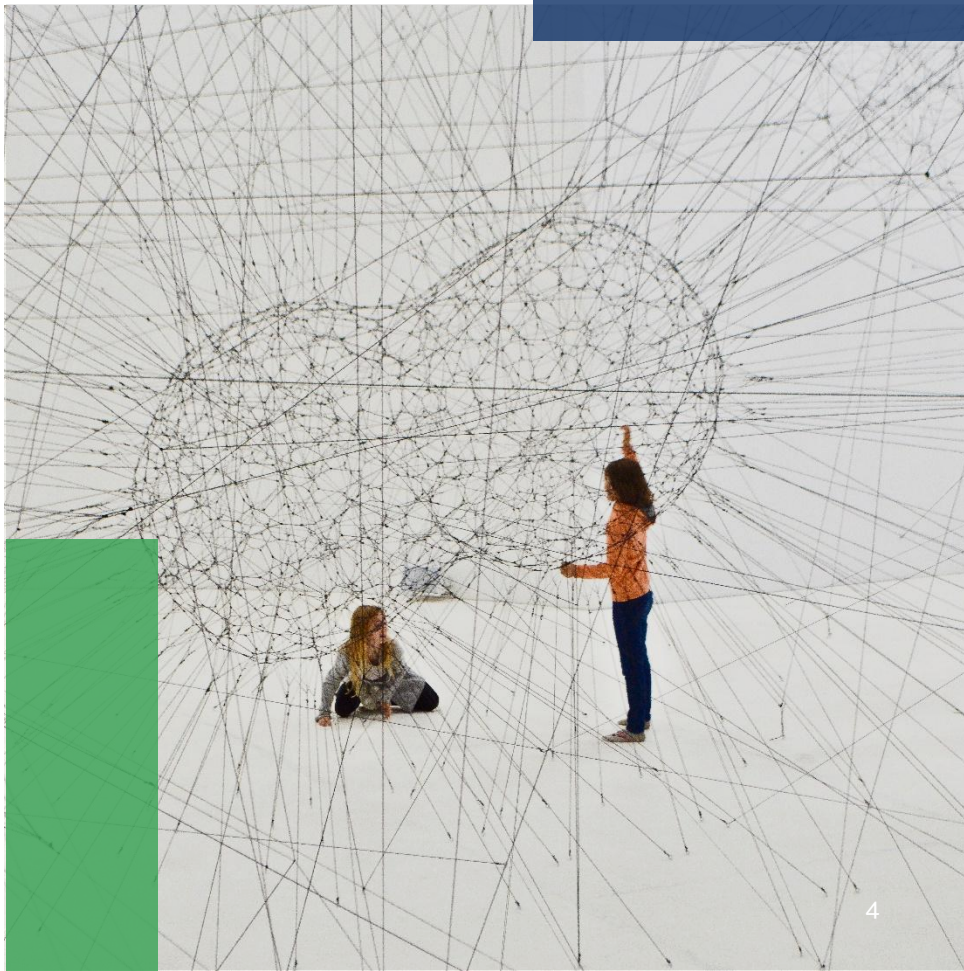
Why the growing interest in a systems thinking approach

We are all systems thinkers

We all grew up exploring our natural and social worlds and asking questions born of curiosity. We can look at problems, see beyond the obvious, and explore otherwise hard to see connections.

But in many school and workplace settings today knowing the “right answers” is often rewarded over systems-based inquiry and creativity.

Yet in today’s more crowded, and rapidly changing, world there are fewer instances where all that is needed is a “right answer” – rather there are more perspectives, interconnections and interdependencies to consider!



Hence the growing interest in learning to strengthen systems thinking practices, and manage organisational cultures that encourage its use in both problem structuring and solution design.

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Systems thinking enables us to:

Change our thinking to match the interconnected, dynamic complexity of our communities and their environments

Communicate with others to create new ways of thinking and seeing - and develop shared understanding

Change our behavior to work with the complex forces in the system (instead of against them) to realize our vision

Identify and test a wider variety of **possible actions and solution pathways**

Become more aware of the potential for unintended consequences of our actions

Harness **social learning** processes to help us develop a shared understanding and take action collectively

Expand the choices available to us and identify those choices where we can **develop significant leverage**

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Of course - not all systems are the same!

There are different kinds of systems

Simple / complicated

Complex and adaptive

We need to understand them, and use different management styles for each

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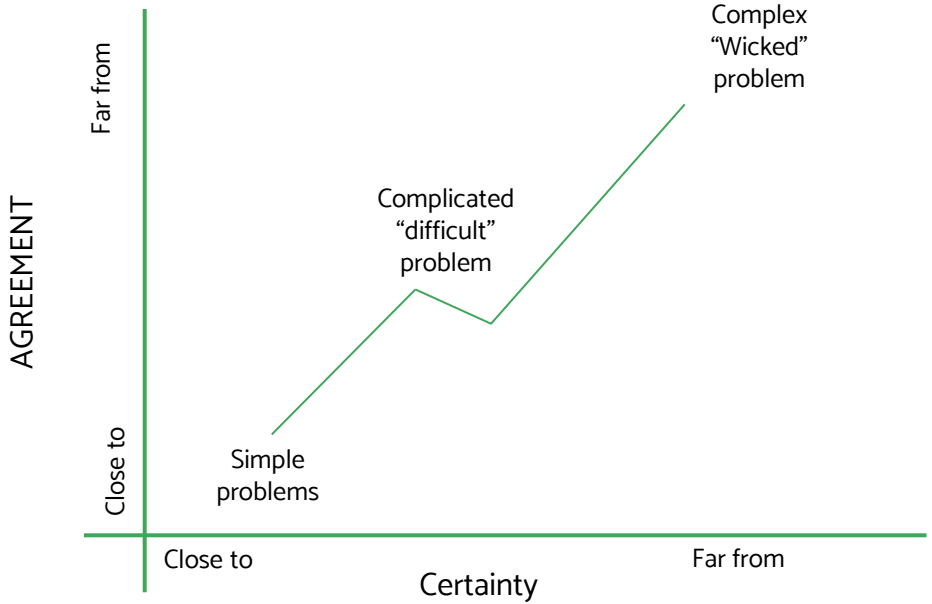
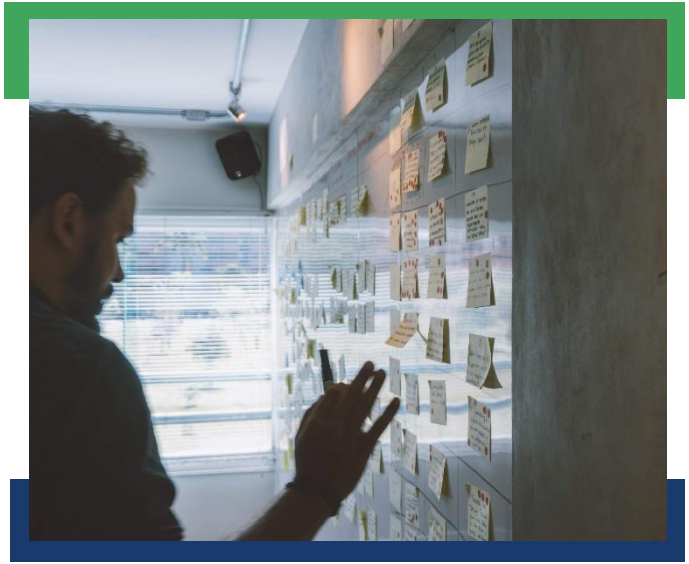
A typology of problem situations





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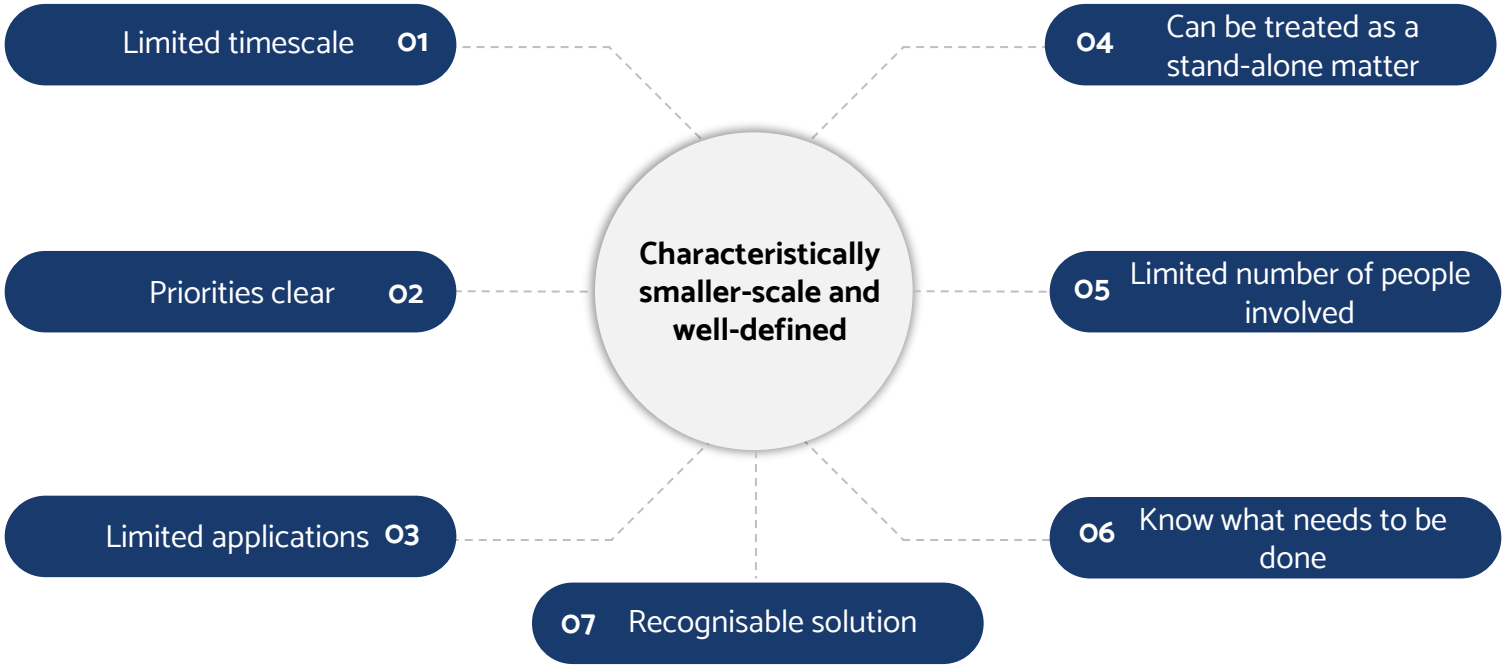
Difficult problems


Limited timescale 01
Priorities clear 02
Limited applications 03
Characteristically smaller-scale and well-defined
04 Can be treated as a stand-alone matter
05 Limited number of people involved
06 Know what needs to be done
07 Recognisable solution

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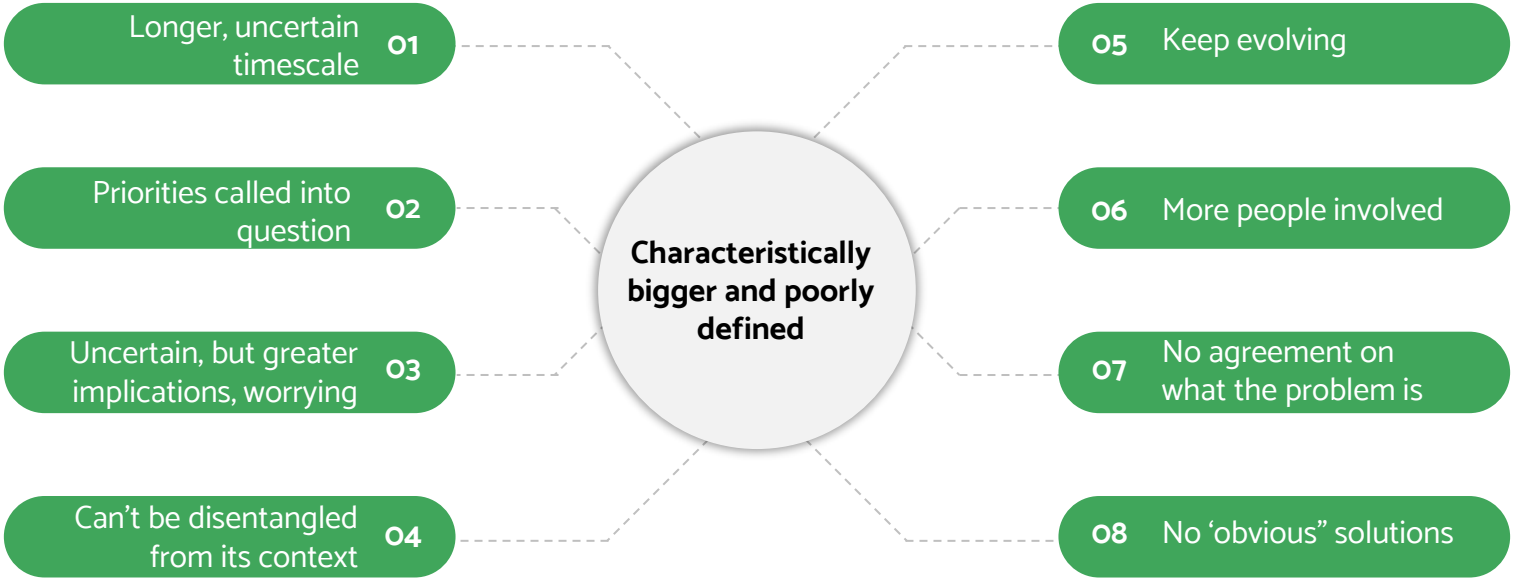
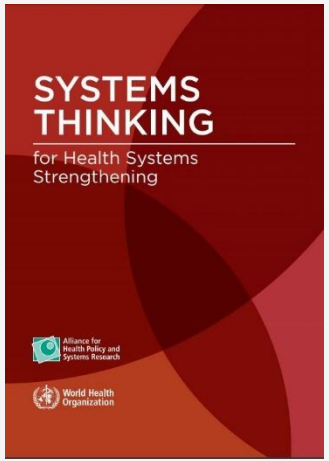
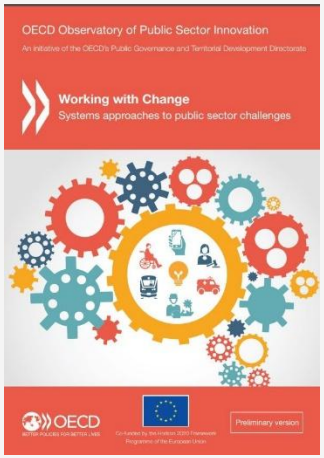
Wicked problems


Longer, uncertain timescale 01
Priorities called into question 02
Uncertain, but greater implications, worrying 03
Can't be disentangled from its context 04
Characteristically bigger and poorly defined
05 Keep evolving
06 More people involved
07 No agreement on what the problem is
08 No 'obvious" solutions

International agencies and public sector organizations are moving towards systems thinking .....


SYSTEMS THINKING
for Health Systems Strengthening
Alliance for Health Policy and Systems Research
World Health Organization


OECD Observatory of Public Sector Innovation
An initiative of the OECD's Public Governance and Territorial Development Directorate
Working with Change
Systems approaches to public sector challenges
OECD
Preliminary version

To deal with complex or 'wicked' problems which

Go beyond range of any one organization to manage them

Are often characterised by disagreement about causes, and how to tackle them

Recognize the need to change behaviour or practice at multiple levels and scales (individuals to organizations)

Require innovative solutions that can be adapted in the light of experience and feedback

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Different systems require different management

Managing a complicated system

- Develop explicit plans
- Plan then act
- Look for agreement & clear outcome
- Limit types of approaches & actions
- Set targets
- Drive implementation

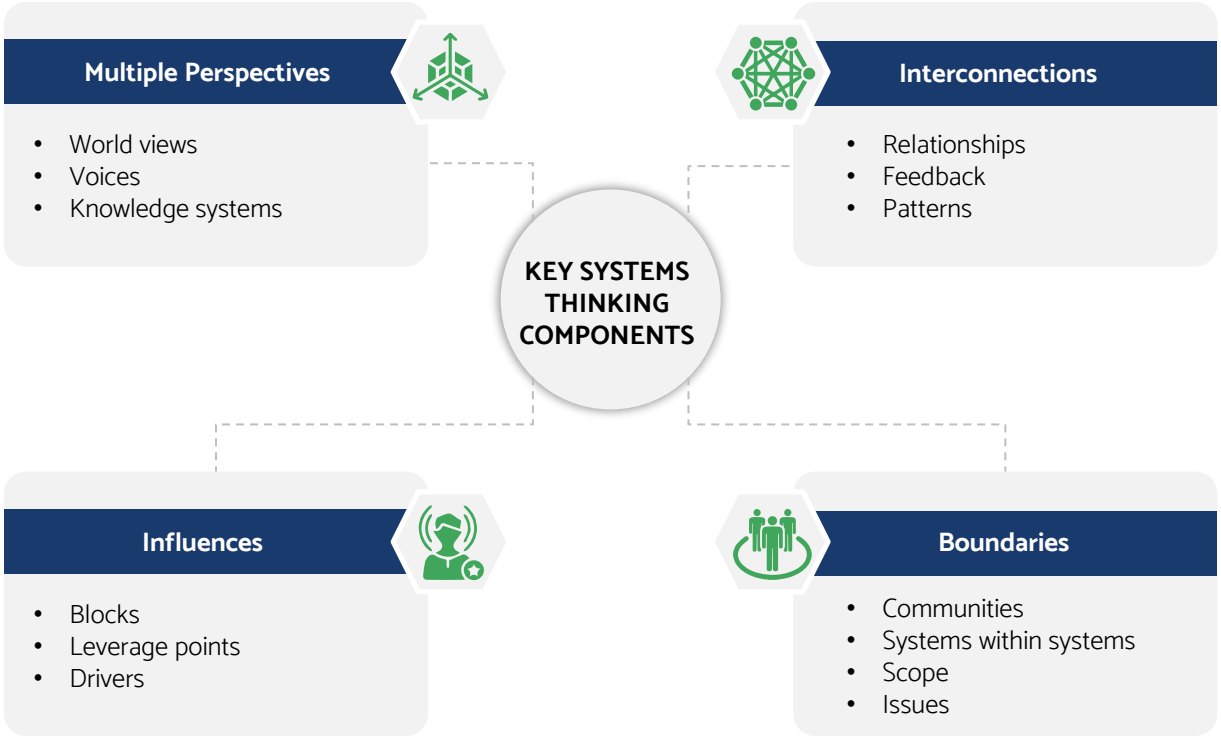
Managing a complex adaptive system

- Look for divergence
- Act, learn, and plan at the same time
- Use minimum specifications
- Work on multiple leverage points
- Be creative with opportunities at the boundaries
- Build on what emerges and grows

02

Basics of systems thinking

Key systems thinking components



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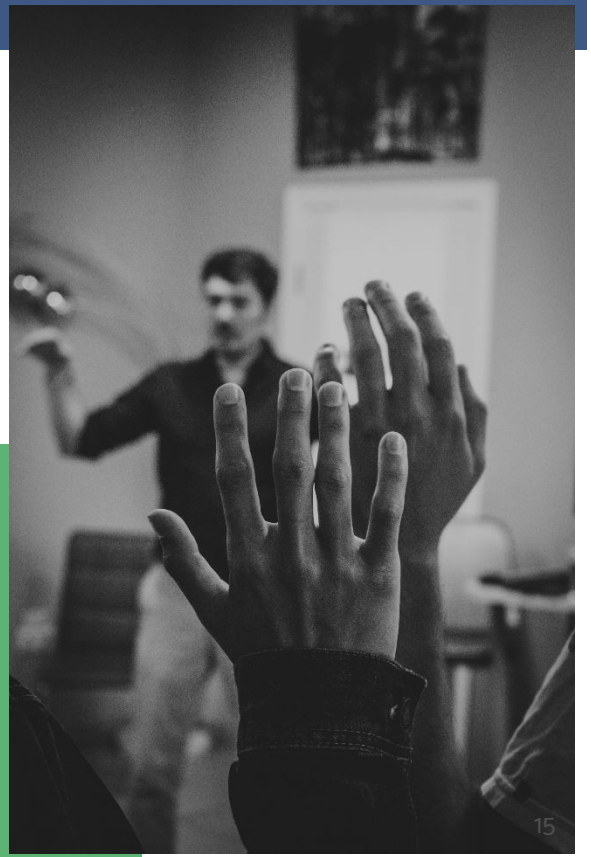
Multiple Perspectives

Who or what are the key stakeholders in this situation?

What stakes (individual values and motivations) do they have?

What are the different ways in which the situation can be framed or understood – by whom?

What stakes (individual values and motivations) do they have?



Interconnections

How do the elements within the situation (components, stakeholders, knowledge, etc.) interconnect?

Leverage points are seen as key points with which to intervene in complex systems

What patterns emerge from these relationships in action - with what consequences, and for whom?

Boundaries

Define scope and scale (and from what/whose perspective is this developed.)

Are other boundaries possible – and feasible?

Agree on how to structure the problem situation

Discuss what constitutes an improvement – and how this might be different for different stakeholders?

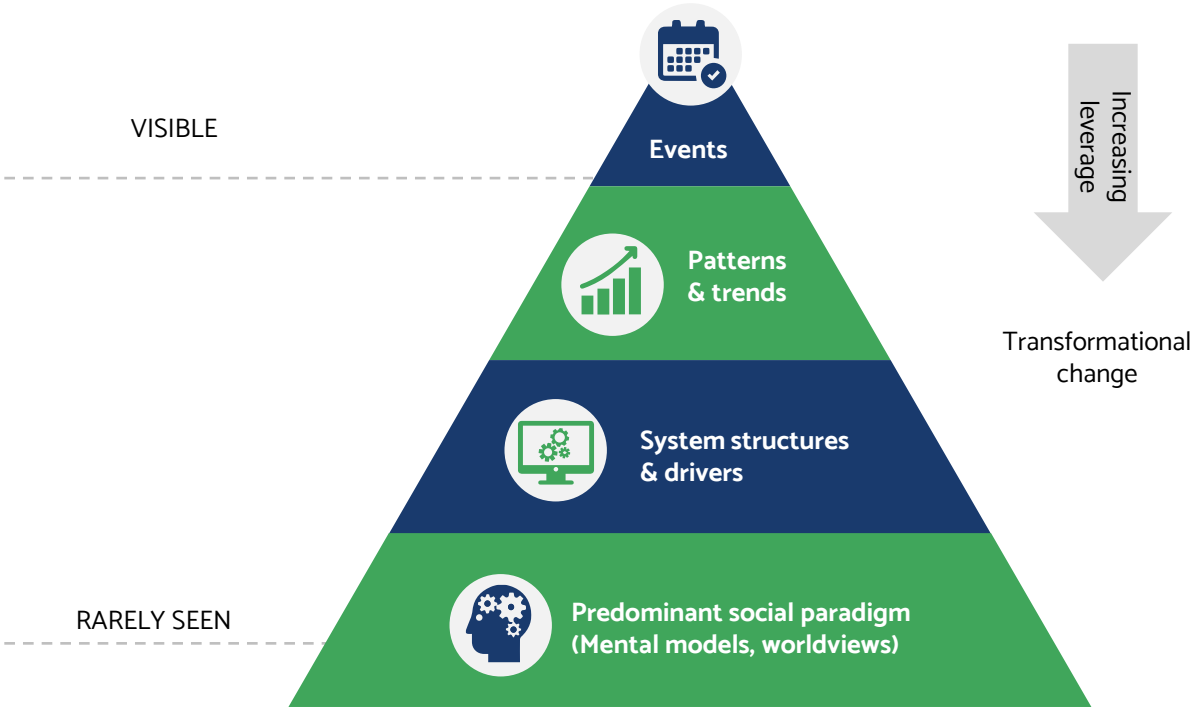
Influences

What drives the systems in question in particular directions

Identify .... drivers, trends, enablers, blocks, leverage points

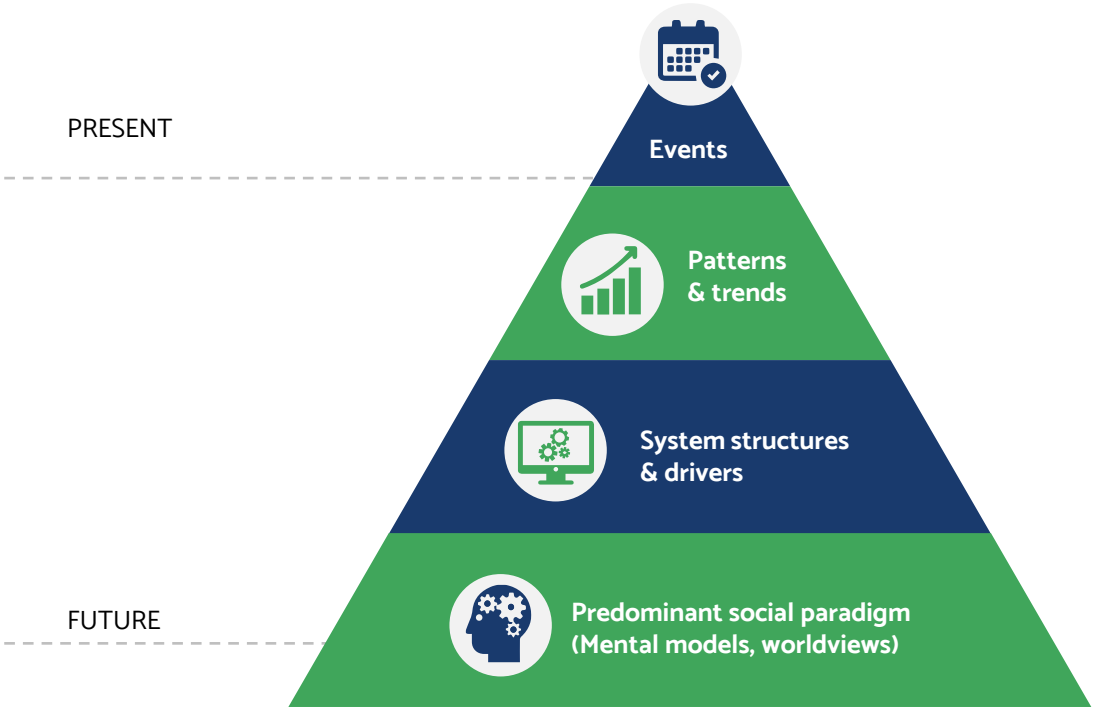
Leverage points are seen as key points with which to intervene in complex systems

The iceberg model for systems thinking



The iceberg model is a systems thinking tool designed to help an individual or group discover the patterns of behaviour, supporting structures, and mental models that underlie a particular event.

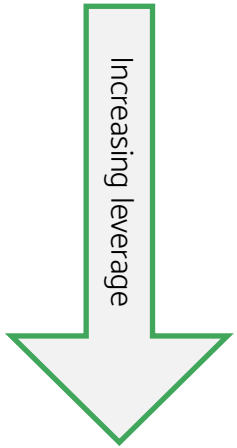
Some questions to help unpack the system

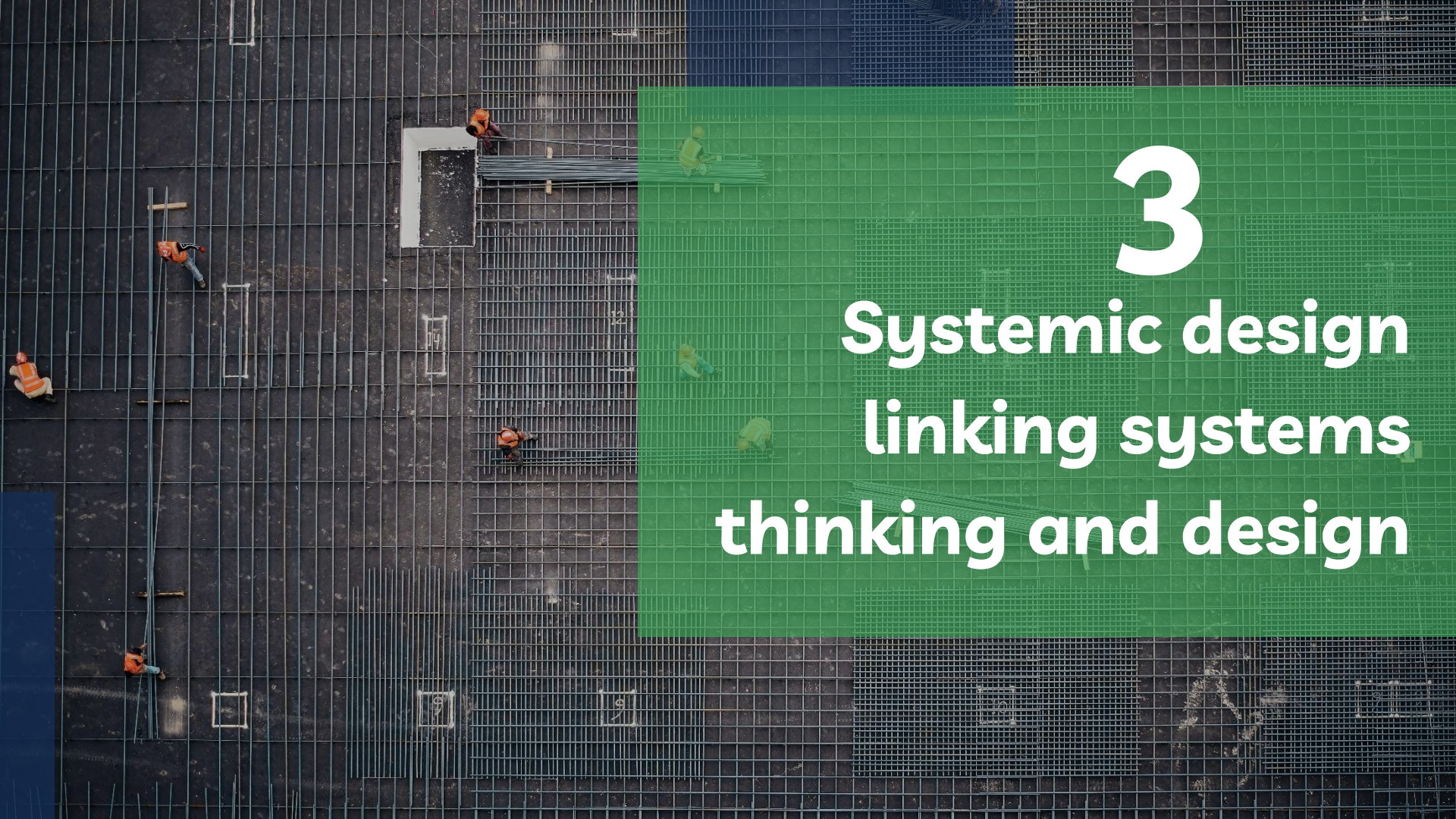


- What is the fastest way to react to this event NOW?
- What trends and/or patterns are occuring?
- What mental/organizational structures create the patterns?
- What are the stated/unstated visions that generate this structure?

Donella Meadows' 12 leverage points: places to intervene in a system

- Numbers
- Buffers
- Stock and flow structures
- Delays
- Balancing feedback loops
- Reinforcing feedback loops
- Information flows
- Rules
- Self-organization
- Goals
- Paradigms
- Transcending Paradigms

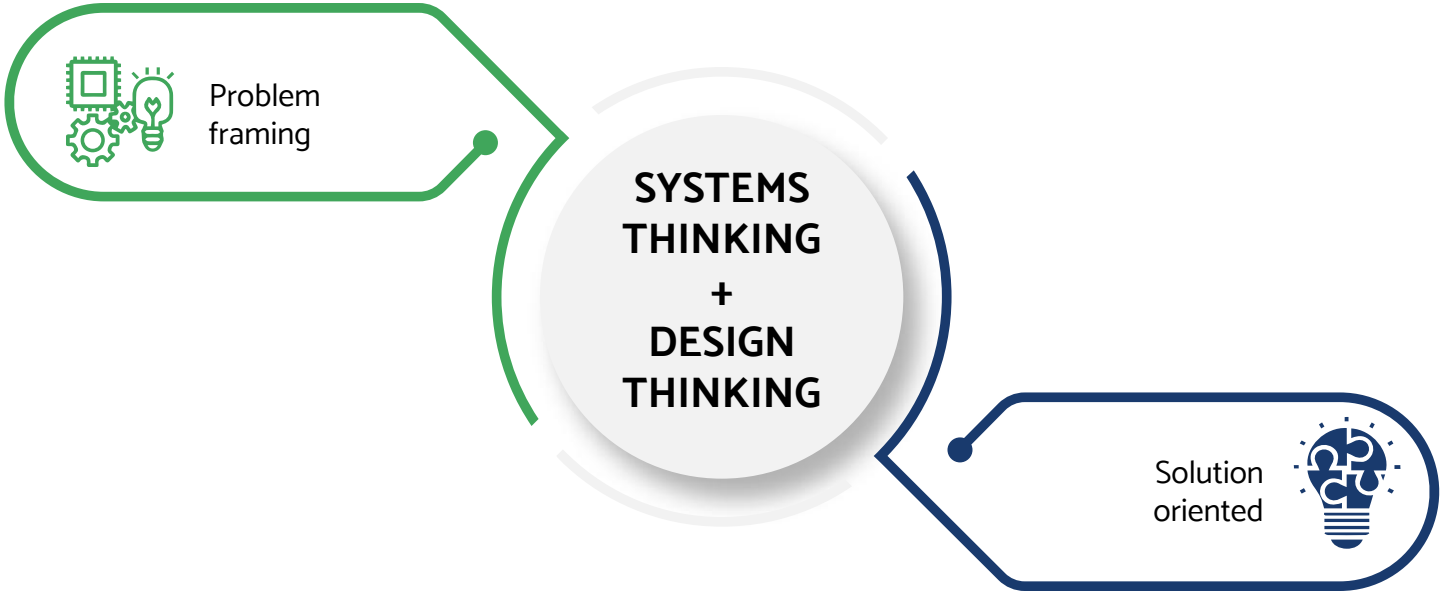




3

Systemic design linking systems thinking and design

Linking systems thinking and design



Systemic design - Integrating the mindsets and toolsets of systems thinking and design thinking to encourage learning and innovative systems change

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Systemic design

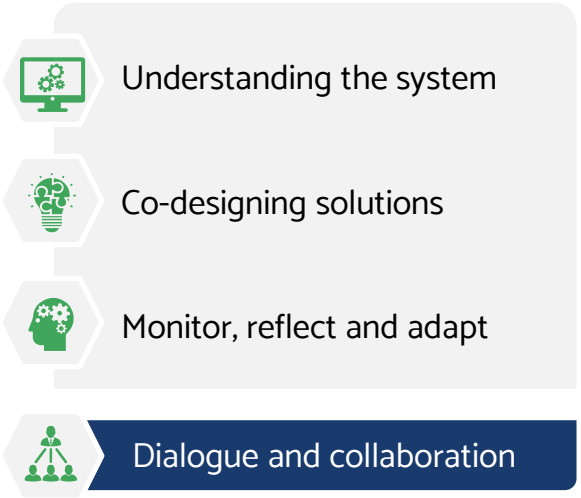
These frameworks link together to support collaborative decision-making. For example key functions in a typical adaptive management/policy setting process may include:

[Systems thinking] Involving participants in understanding issue and wider context (recognizing different perspectives/problem structuring, potential leverage points)

[Design thinking] Jointly develop action plans (identify activities, outcomes, and assumptions) and M&E plans

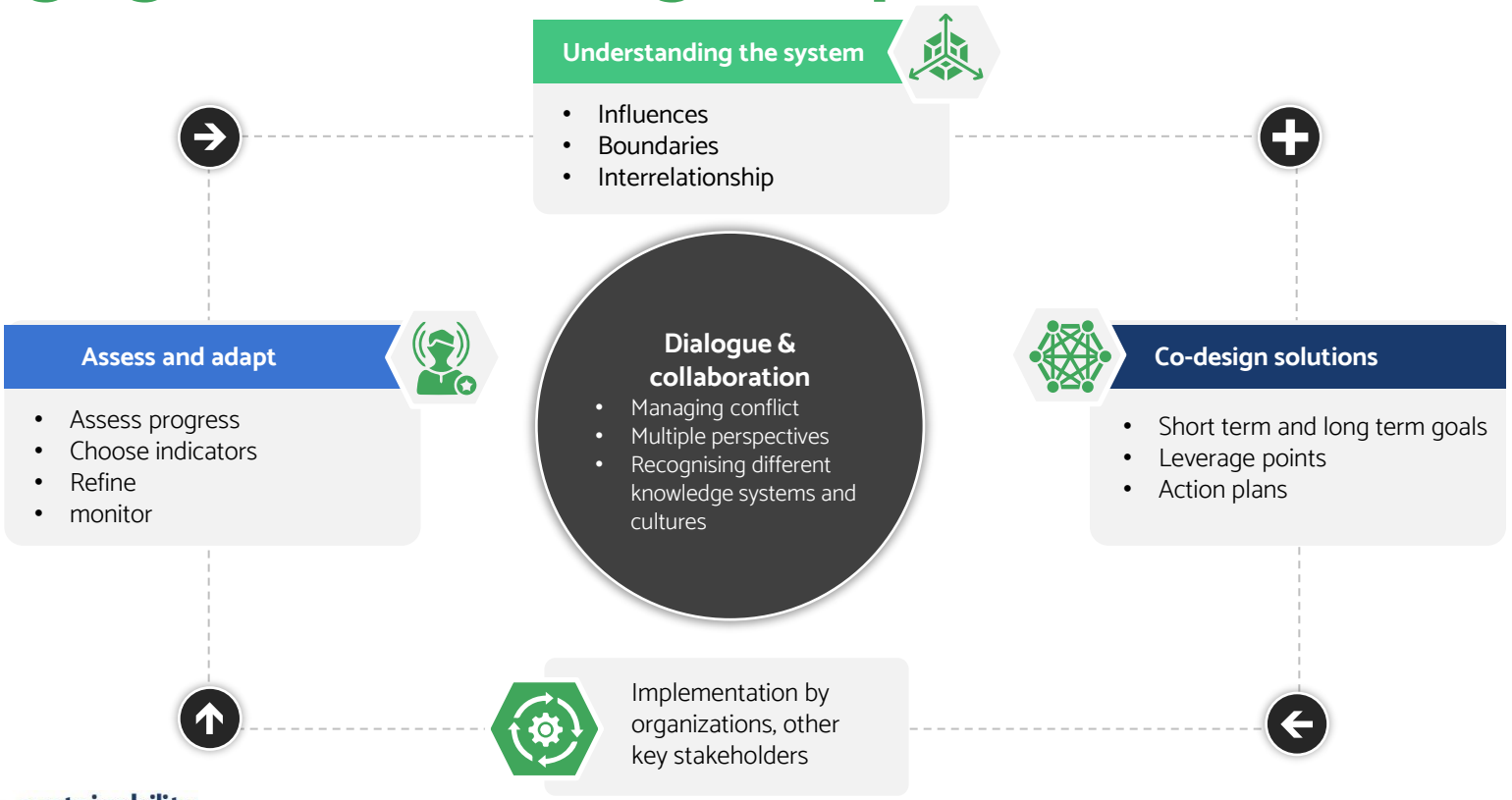
[Reflective thinking] Learn and refine (adaptive management)

Tools/methods for systems thinking and systemic design can be grouped by function



The first three functions essentially can be seen as linked elements in an iterative and experiential learning cycle – in a systems approach each is best carried out using tools that support dialogue and collaboration among the stakeholder groups involved.

Key systems thinking components



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04

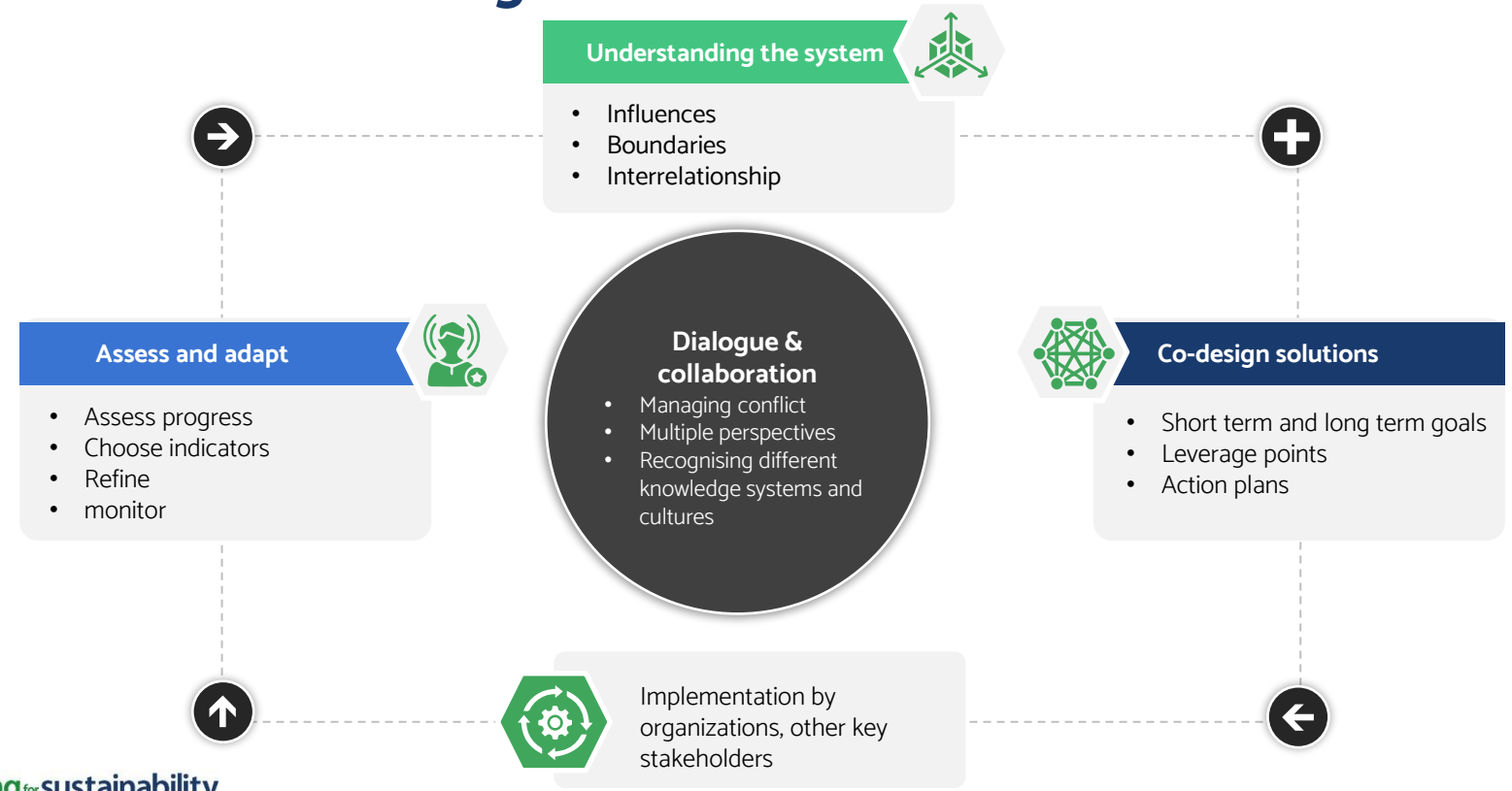
Tools and methods for systems thinking and systems design

There are so many!

> Over the years, I've found that starting with methods, whether causal loop diagrams or Soft Systems Methodology or Social Network Analysis, often confuses or exasperates novices ....
>
> ... furthermore, no single method will equip them with the power of the systems field.

~ **Bob Williams**

Important to see how sets of tools / methods fit in the bigger process in which they are used



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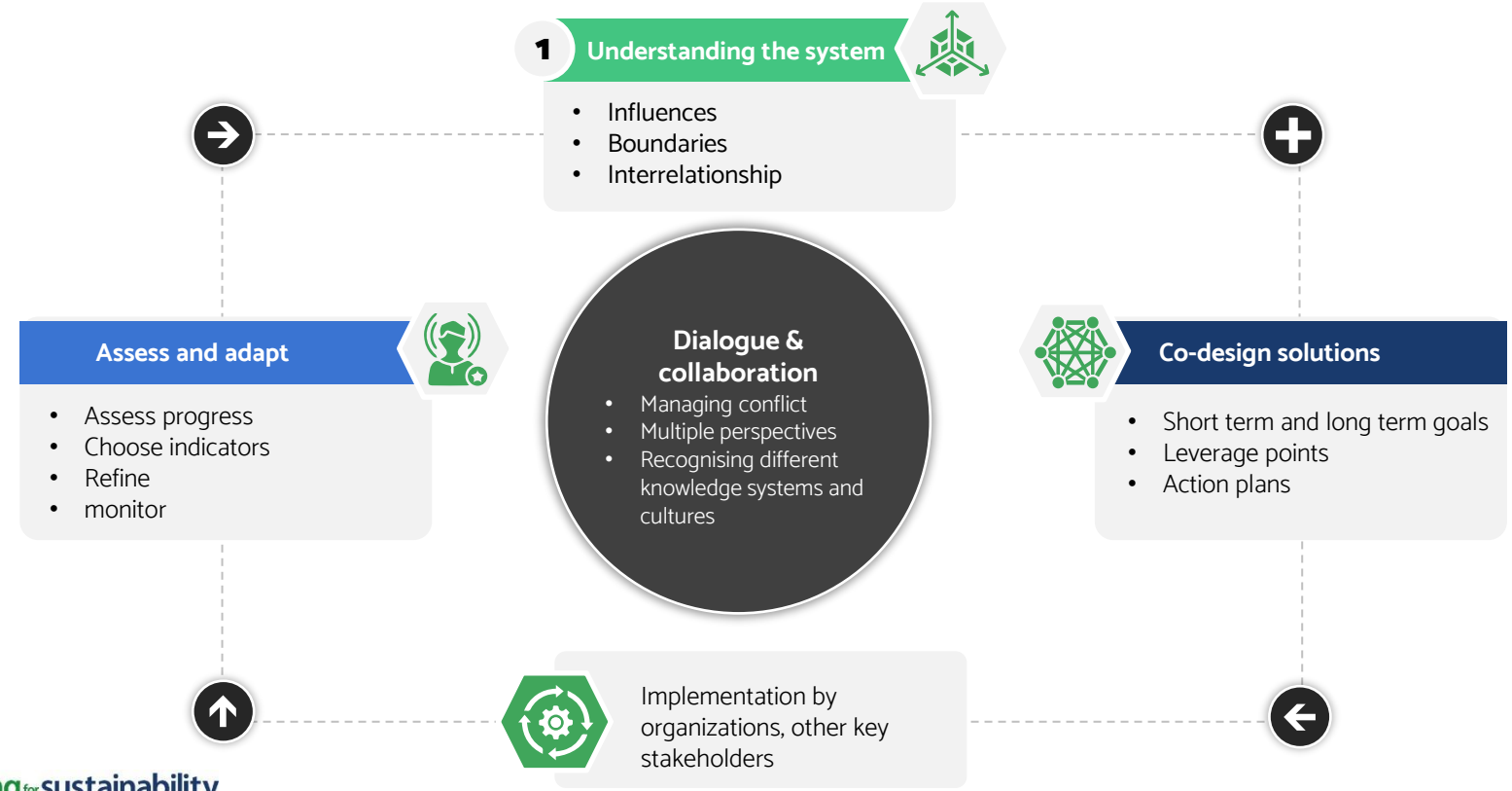
1. Tools for understanding the system



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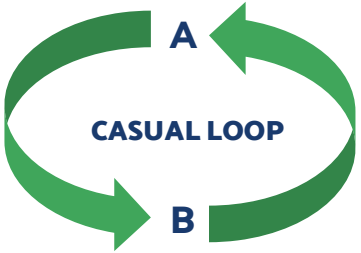
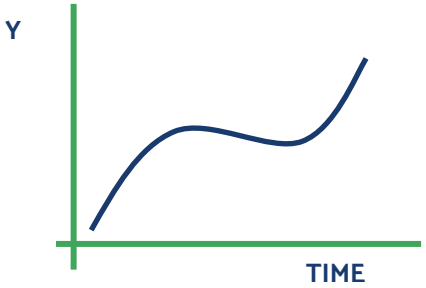
Understanding the system
tools for seeing things

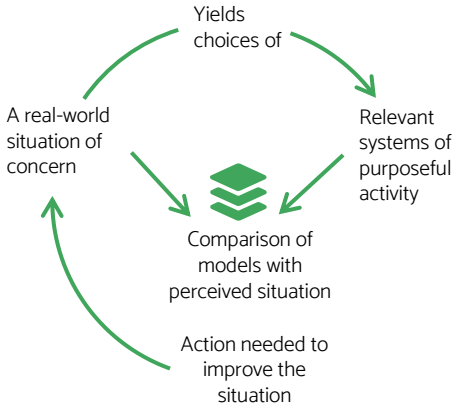
- Timelines
- Trend analysis
- System archetypes
- Rich pictures
- Cynefin framework/Stacey diagram
- Concept mapping
- Social network analysis
- Causal loop diagrams
- Bayesian belief networks
- Computer models
- etc



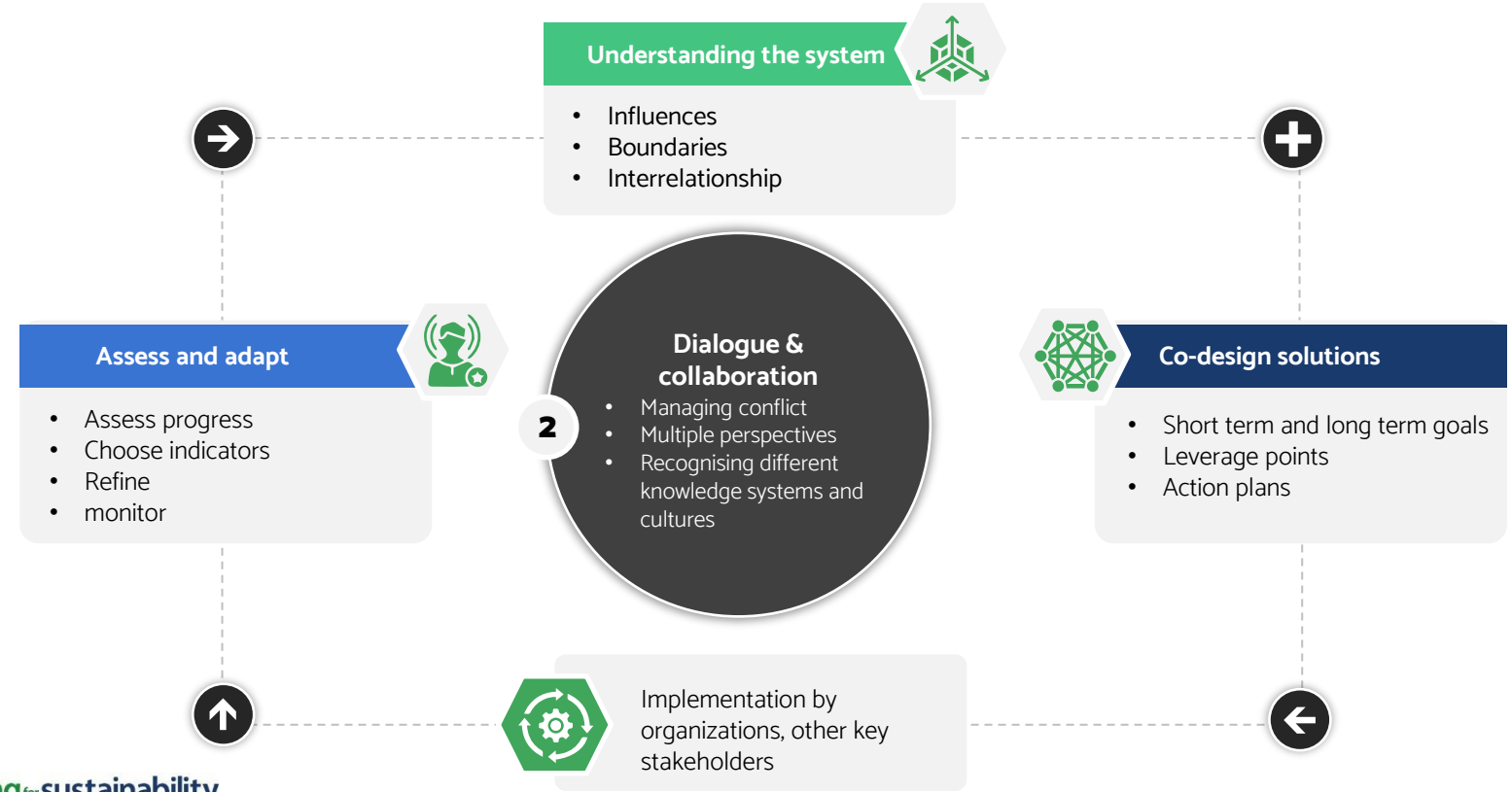


Understanding the system
tools for thinking strategically

- CATWOE
- Iceberg model
- System archetypes
- Soft Systems Methodology (SSM)
- Scenarios and visioning
- Problem structuring methods
- SWOT/TOWS analysis
- STEEP (PEST, PESTLE, STEP, etc.)
- etc


Yields choices of
Relevant systems of purposeful activity
Comparison of models with perceived situation
Action needed to improve the situation
A real-world situation of concern

2. Tools for dialogue and collaboration



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Dialogue & collaboration
tools for involving the right people include:

"It's not just who you could get to come at the time"

- Stakeholder analysis
- Engagement planning
- Networking
- Relationship building & management

Dialogue & collaboration
tools for working together

Use multiple methods and always have a plan. Tools include:

Facilitation

Kitchen workshops and meetings

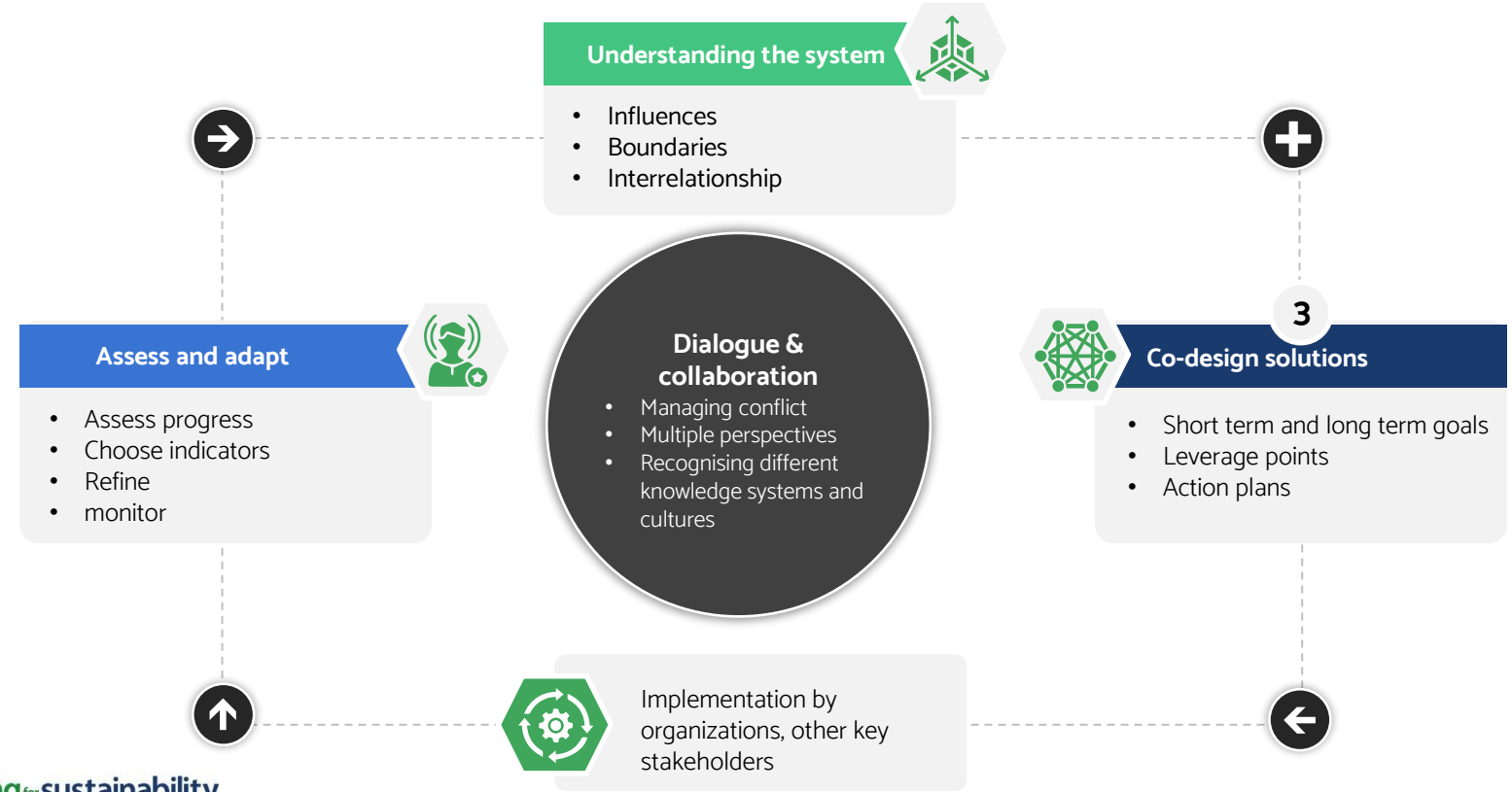
Informal conversations

Networks

Social media

Active listening, appreciative inquiry

3. Tools for co-designing solutions



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Tools for co-design
finding desirable solutions

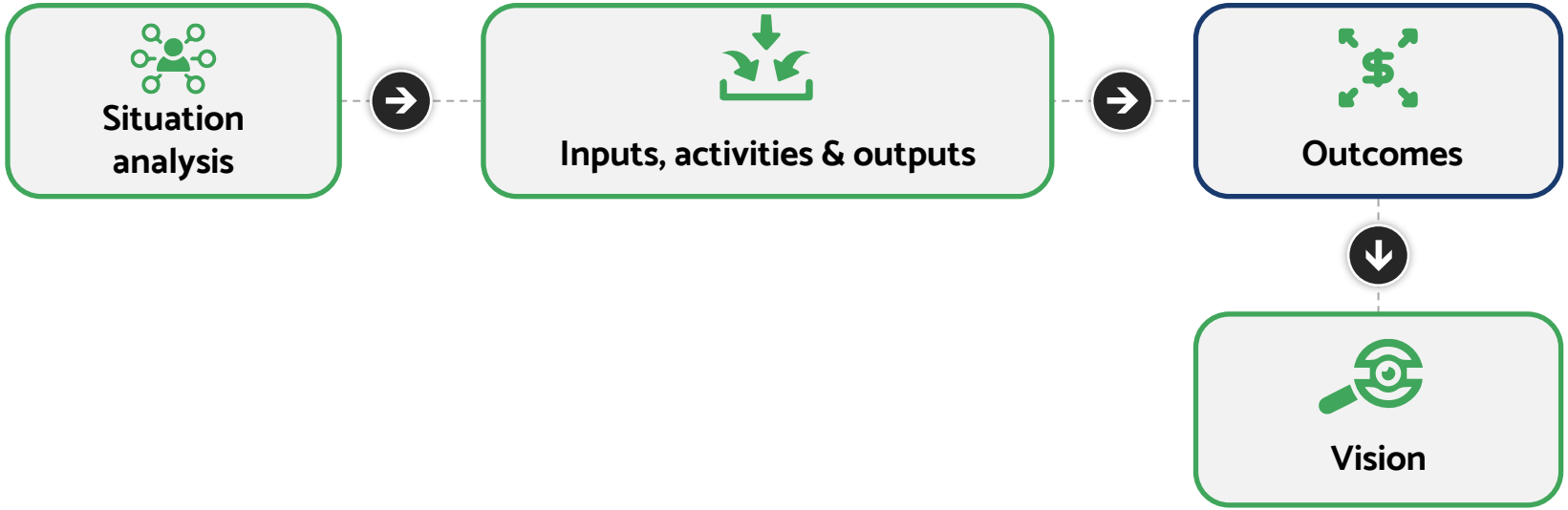
Usually both a product and a process. Approaches include:

Agile planning (scrums & sprints) …. as opposed to waterfalls

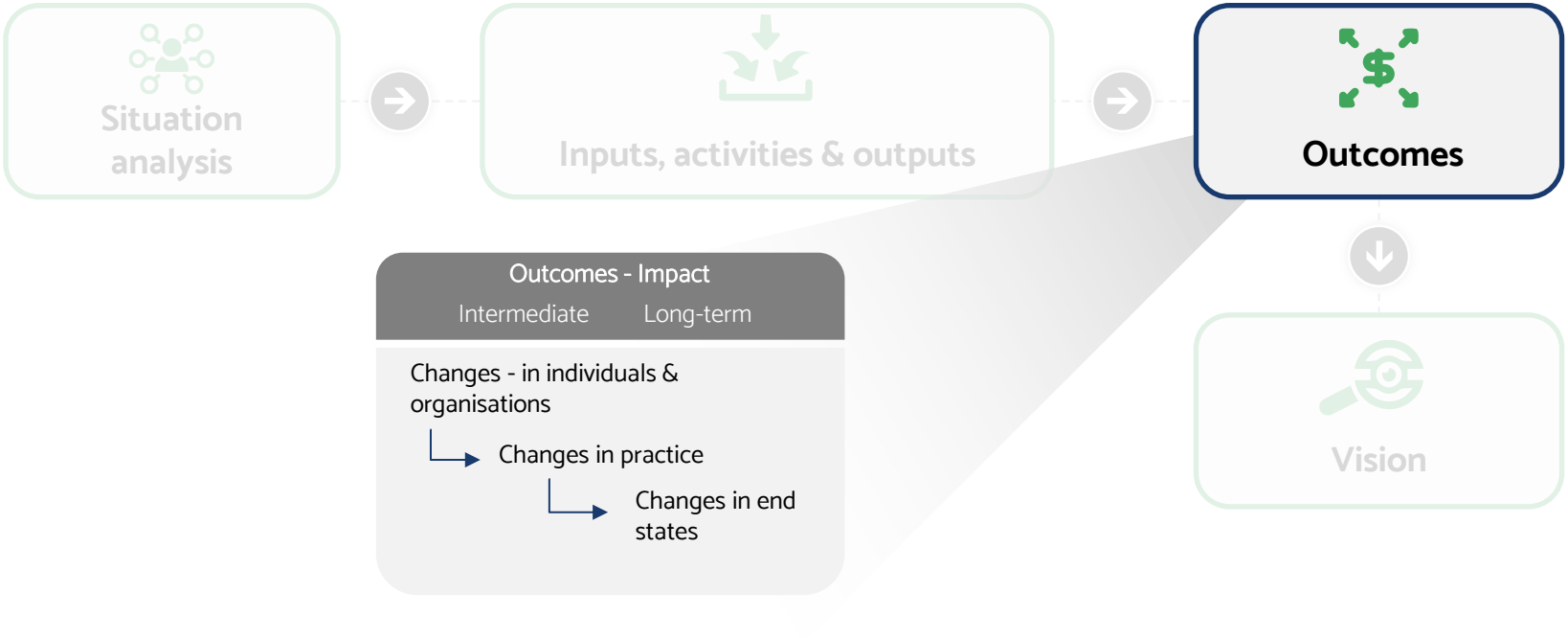
The five stages of Design Thinking (Empathise, Define – the problem, Ideate, Prototype, and Test)

Along with a whole host of methods …. problem structuring methods (PSMs), conceptual models, scenario development, (participatory) system dynamic modelling and simulation, etc.

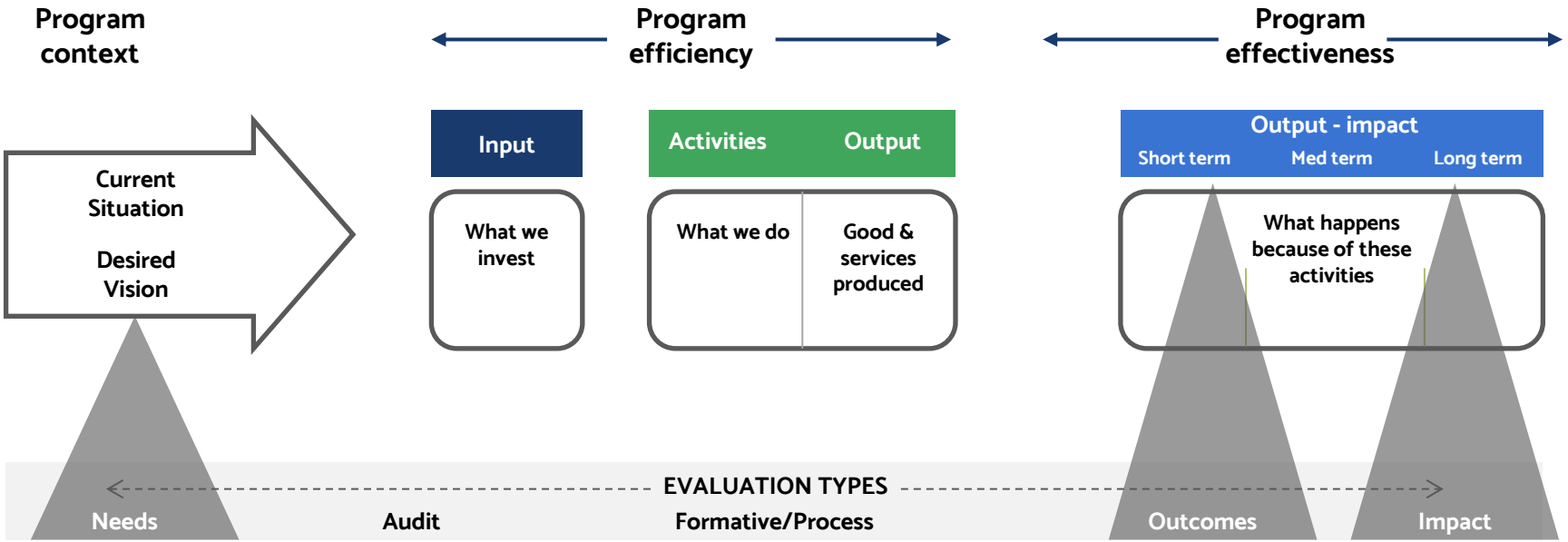
Tools for co-design – outcomes modelling [Theory of Change (ToC) and logic models]



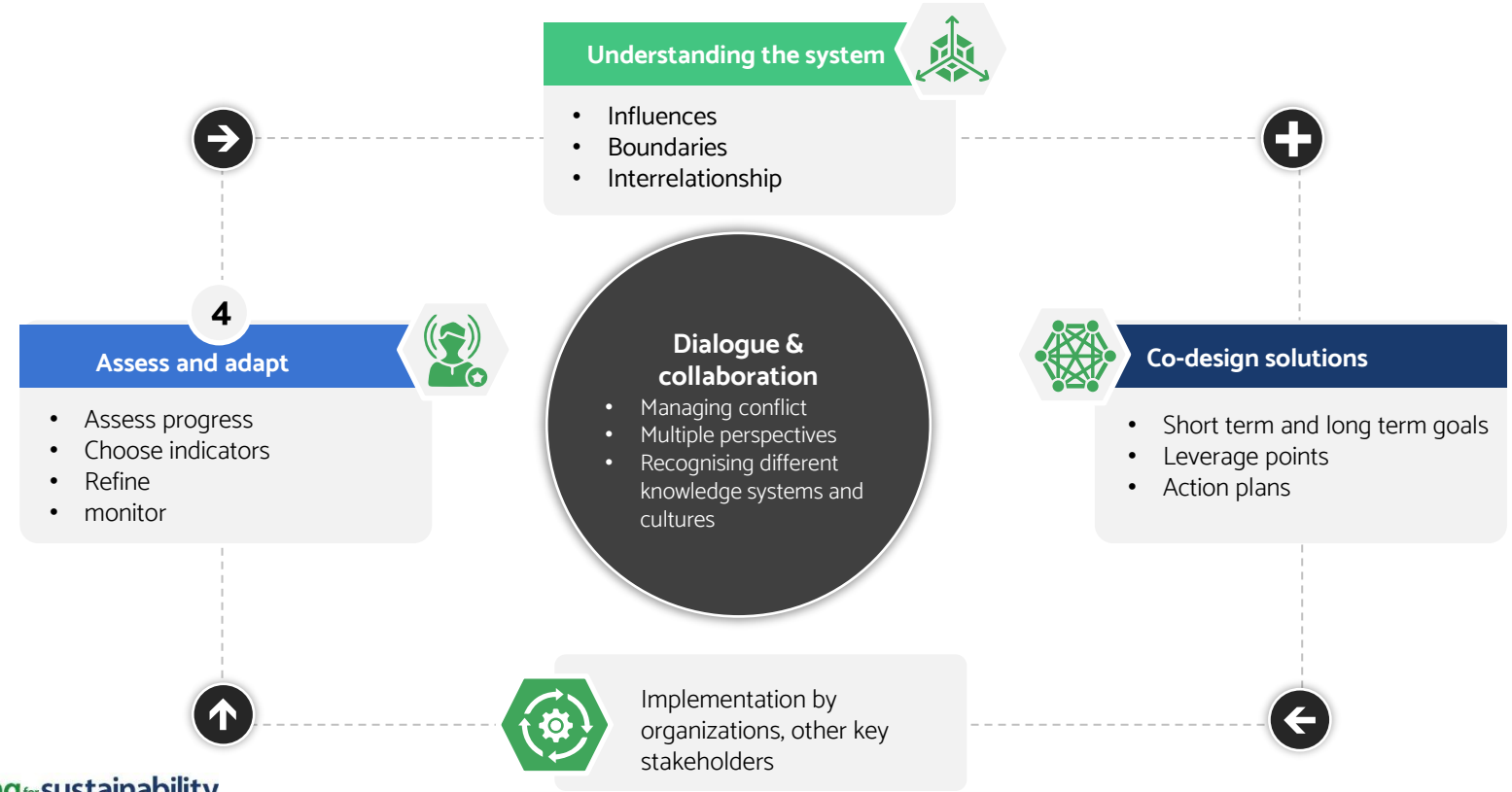
Tools for co-design – outcomes modelling [Theory of Change (ToC) and logic models]



… and helps develop monitoring and evaluation plans along with activity plans



4. Tools/methods for assessing progress



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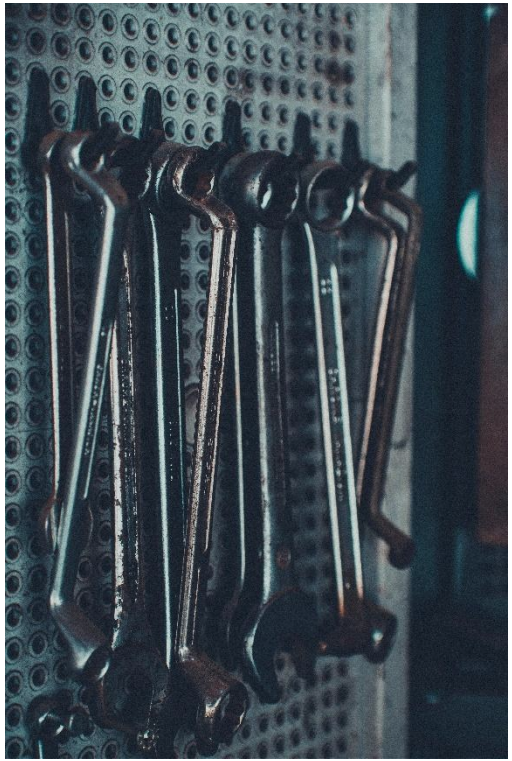
Tools for assessing and adapting include:

Theory of change and accompanying logic models

Complexity-aware monitoring (outcomes mapping, MSC, etc.)

Using rubrics to assess complex tasks and behaviors (intermediate outcomes)

Facilitating reflective practice (After Action Reviews – AARs and Strategic Learning Debriefs



05

Embedding systems thinking in practice

It is important to create a learning organization where:

People continually expand their capacity to create the results they truly desire

New and expansive patterns of thinking are nurtured

Collective aspiration is set free … and

People are continually learning to see the whole together.

~ Peter Senge 1990 – The Fifth Discipline

Common challenges that often have to be faced include

The perception that learning (collaboration and dialog) takes too long

Too few people with the skillsets and resources required to follow through

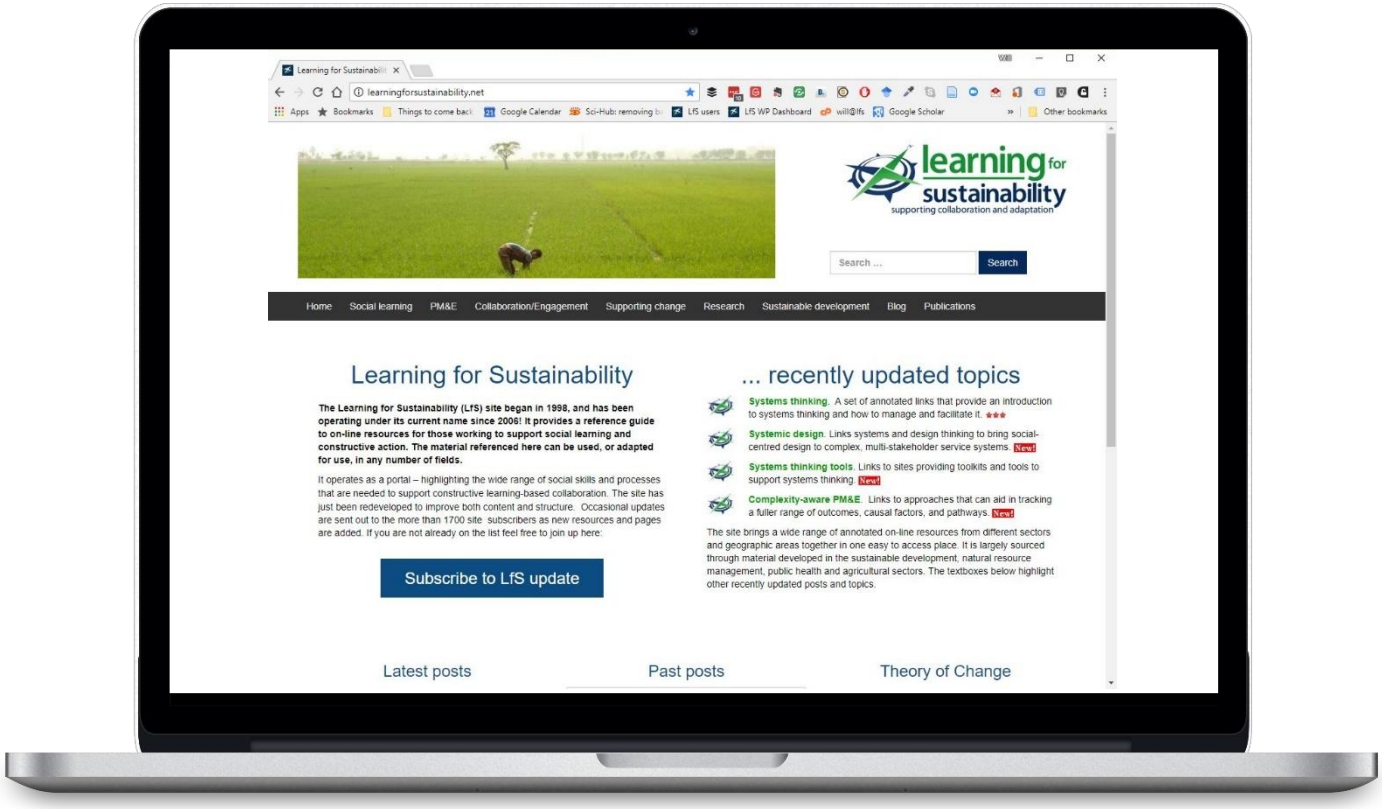
Exploring one's personality and goals in a group can sometimes seem threatening and daunting

A lack of safe spaces for groups to work in this different way

A lack of formal commitment to the process from organizational leadership

Senge: the five core disciplines
required for a successful learning organization

- Systems Thinking
- Personal Mastery
- Mental Models
- Building Shared Vision
- Team Learning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Learning for Sustainability
The Learning for Sustainability (LfS) site began in 1998, and has been operating under its current name since 2006! It provides a reference guide to on-line resources for those working to support social learning and constructive action. The material referenced here can be used, or adapted for use, in any number of fields.
It operates as a portal – highlighting the wide range of social skills and processes that are needed to support constructive learning-based collaboration. The site has just been redeveloped to improve both content and structure. Occasional updates are sent out to the more than 1700 site subscribers as new resources and pages are added. If you are not already on the list feel free to join up here:
Subscribe to LfS update
... recently updated topics
Systems thinking. A set of annotated links that provide an introduction to systems thinking and how to manage and facilitate it. ★★★
Systemic design. Links systems and design thinking to bring social-centred design to complex, multi-stakeholder service systems. New!
Systems thinking tools. Links to sites providing toolkits and tools to support systems thinking. New!
Complexity-aware PM&E. Links to approaches that can aid in tracking a fuller range of outcomes, causal factors, and pathways. New!
The site brings a wide range of annotated on-line resources from different sectors and geographic areas together in one easy to access place. It is largely sourced through material developed in the sustainable development, natural resource management, public health and agricultural sectors. The textboxes below highlight other recently updated posts and topics.
Latest posts
Past posts
Theory of Change

For more information

- Dr Margaret Kilvington – margaret.kilvington@gmail.com
  - Independent Social Research, Evaluation & Facilitation

- Dr Will Allen – willallennz@gmail.com
  - Will Allen & Associates / Learning for Sustainability

- Annotated links to a wide range of related on-line material can be found via the Learning for Sustainability clearinghouse - https://learningforsustainability.net/

Reference as: Allen & Kilvington (2018) Summary: An introduction to systems thinking and systemic design – concepts and tools (Presentation). Based on material for an introductory workshop. Available online https://learningforsustainability.net/pubs/systemicdesign-intro.pdf

Topic information:

SLIDE 8: See: Ralph D. Stacey and Dave Snowden
SLIDE 12: Complicated or complex – knowing the difference is important
SLIDE 19: Systems thinking: what, why when, where and how
SLIDE 21: Leverage points – places to intervene in a system
SLIDE 23: Systemic design
SLIDE 24: Systemic design
SLIDE 28: All methods are wrong - some methods are useful
SLIDE 31: Systems methods and tools
SLIDE 32: Strategy tools and approaches
SLIDE 34: Stakeholder mapping and analysis
SLIDE 35: Using dialogue and negotiation
SLIDE 38: Theory of Change and logic models
SLIDE 41: Planning, monitoring & evaluation – closing the loop
SLIDE 45: Organizational learning
SLIDE 47: Learning for Sustainability website

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